Solar Probe Plus (SPP) Investigations AO
Pre-Proposal Conference

Solar Probe Plus AO
Technical, Management, and Cost (TMC) Evaluation

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Summary of Criteria for each Proposal Type

Criteria	AO Section	Form	Applicable to Instrument(s) proposal	Applicable to Observatory Scientist
Scientific Merit	7.2.2	Form A	Yes	Yes
Scientific Implementation Merit and Feasibility	7.2.3	Form B	Yes	No
Feasibility of the Instrument Investigation Implementation, Including Cost Risk	7.2.4	Form C	Yes	No
Scientific Implementation Merit and Feasibility of the Proposed Plans for Providing Independent Input to the SWG	7.2.5	Form D	No	Yes
Suitability of the Proposer for the Observatory Scientist Position	7.2.6	Form E	No	Yes

TMC Evaluation Factors - Section 7.2.4 Applies to Instrument(s) proposals

The technical and management approaches of all submitted instrument science investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule. The factors for feasibility of instrument investigation implementation include the following:

Factor C-1. **Adequacy and robustness of the technical plan.** This factor includes assessment of implementation elements such as: the overall investigation observation plan within the planned mission design; the instrument design and design margins; the impact of the instrument on the planned spacecraft design, the impact of the instrument on payload resources, the impact of the proposed location of the instrument on the spacecraft and other instruments; and the proposer's understanding of the processes, products, and activities required to accomplish development and integration of all elements (flight systems, ground and data systems, etc.*)*. This factor includes investigation resiliency – the flexibility to recover from problems during both development and operations – including the technical resource reserves and margins, system and subsystem redundancy, and reductions and other changes that can be implemented without impact to the Baseline Science Investigation.

TMC Evaluation Factors - continued
Section 7.2.4 Applies to Instrument(s) proposals

Factor C-2. **Adequacy and robustness of the cost plan and schedule.** This factor includes assessment of proposal elements such as cost and cost risk, the adequacy of the approach, the methods and rationale used to develop the estimated cost, the discussion of cost risks, the subcontracting plan, and the team's understanding of the scope of work (covering all elements of the investigation, including contributions). Proposals will be evaluated for the adequacy of the cost reserves and whether proposals with inadequate cost reserves demonstrate a thorough understanding of the cost risks. This factor also includes assessment of proposal elements such as the relationship of the work to the project schedule, the project element interdependencies, the associated schedule margins, and an assessment of the likelihood of launching by the proposed launch date. Also evaluated under this factor are the proposed cost and schedule management tools to be used on the project.

Factor C-3. **Adequacy of the management approach, including the capability of the management team.** This factor includes: the adequacy of the proposed organizational structure; the management approach; the roles, qualifications, and experience of the PI, PM, other named key management team members, and implementing organization, management team, and known partners; the commitment, spaceflight experience, and relevant performance of the PI, PM, other named key management team members, and implementing organization, management team, and known partners against the needs of the investigation; the commitments of partners and contributors; and the team's understanding of the scope of work covering all elements of the investigation, including contributions.

TMC Evaluation Factors - continued
Section 7.2.4 Applies to Instrument(s) proposals

Factor C-4. **Adequacy of the risk management approach.** The adequacy of the proposed risk management approach will be assessed, as will any risk mitigation plans for new technologies, any long-lead items, and the adequacy and availability of any required manufacturing, test, or other facilities. The approach to any proposed descoping of investigation capabilities will be assessed against the proposed Baseline Science Investigation. The plans for managing the risk of contributed critical goods and services will be assessed, including the commitment of partners and contributors, as documented in Letters of Commitment and the adequacy of contingency plans for coping with the failure of a proposed cooperative arrangement or contribution.

Factor C-5. **Technical readiness.** This factor includes the plans for the development and use of new technology and the adequacy of backup plans to ensure success of the investigation when technologies having a TRL less than TRL 6 are proposed. The maturity and technical readiness of the instrument complement and operations systems will be assessed. The adequacy of the plan to mature systems within the proposed cost and schedule, the robustness of those plans, including recognition of risks and mitigation plans for retiring those risks, and the likelihood of success in developing any new technologies will be assessed.

TMC Evaluation

- SPP Instrument Investigation
  - For a SPP instrument suite proposal, there will be one TMC grade for the suite and one for each instrument.
  - For an individual SPP instrument investigation proposal, there will be one TMC grade.
  - TMC grades will be Low Risk, Medium Risk or High Risk.
  - In addition each evaluation will result in a narrative text, including specific major and minor strengths and weaknesses.

- Observatory Scientist
  - No TMC grade

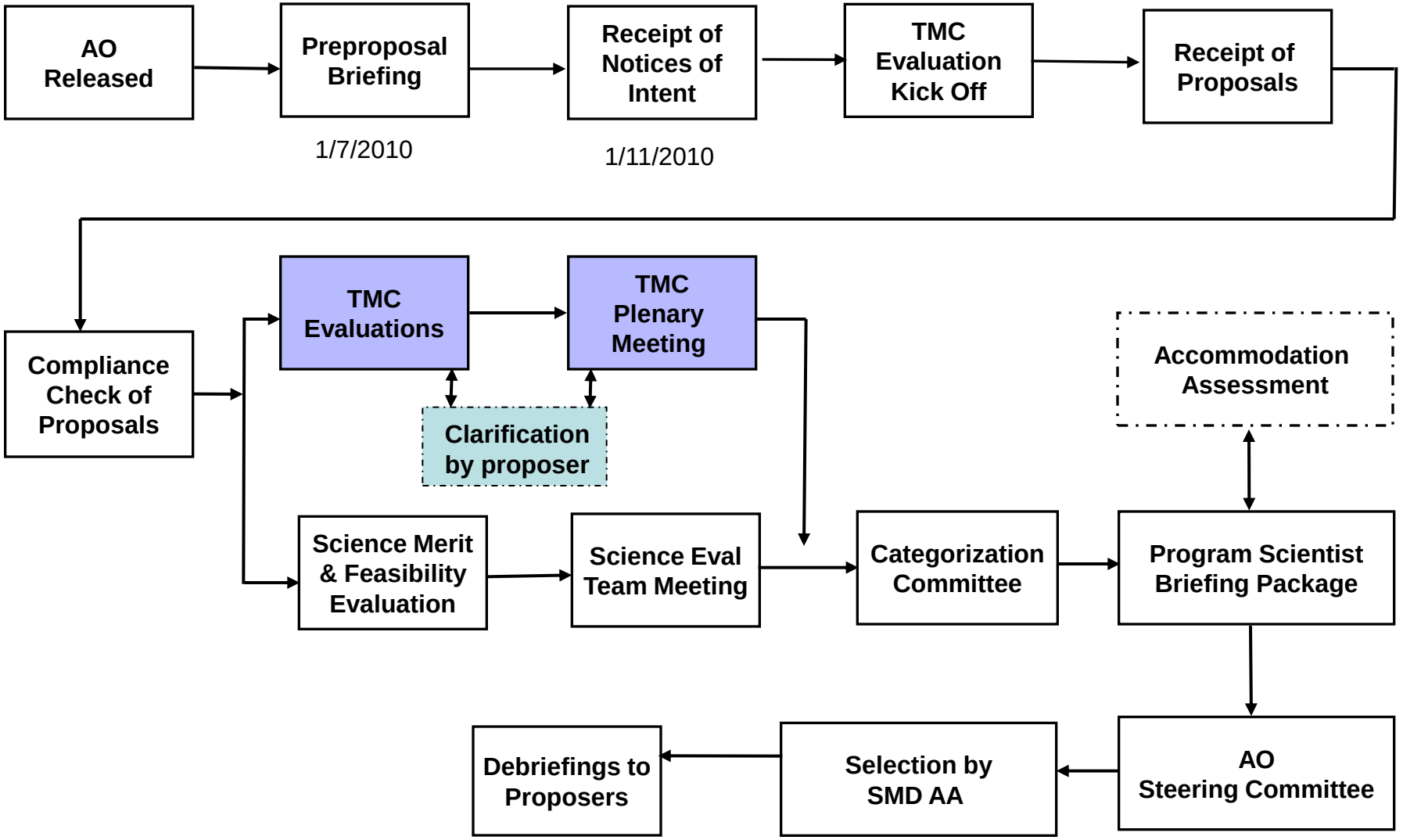
TMC Risk Ratings

- Low Risk - There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the Proposer's capability to accomplish the investigation within available resources.

- Medium Risk - Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Mission design may be complex and resources tight.

- High Risk – One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.

Solar Probe Plus Investigations
Proposal Evaluation & Selection Process



Clarifications of Proposals – Section 7.1.1

Proposers should be aware that, during the evaluation and selection process, NASA may request clarification of specific points in a proposal; if so, such a request from NASA and the proposer's response must be in writing. In particular, before finalizing the evaluation of the feasibility of the instrument investigation implementation (see Section 7.2.4), NASA will request clarification on specific, potential major weaknesses in the feasibility of instrument investigation implementation that have been identified in the proposal. NASA will request such clarification uniformly from all proposers. The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not intend to enter into discussions with proposers. A typical limited response is to direct NASA's attention to pertinent parts of the proposal without providing further elaboration.

Clarifications from Proposers

- NASA will request clarification of potential major weaknesses of the Feasibility of Instrument Investigation Implementation including Cost Risk (Section 7.2.4)
  - NASA will request such clarification uniformly, from all proposers.
  - All requests for clarification from NASA, and the proposer's response, will be in writing.
  - PIs whose proposals have no major weaknesses on this criteria will receive an email informing them of that.
  - The form of the clarifications is strictly limited to a few responses:
    - Identification of the locations in the proposal (page, section, line) where the major weakness is addressed.
    - Noting that the major weakness is not addressed in the proposal, or
    - Informing the reviewers that the major weakness is invalidated by information that is common knowledge or state-of-the-art and is therefore not included in the proposal.
    - Any response that goes beyond a clarification will be deleted and will not be shown to the peer review.
  - The PI will be given 24 hours to respond to the request for clarification.
- NASA may request clarifications on other topics.

TMC Panel

- The Acquisition Manager who is a Civil Servant in the Science Office of Mission Assessments (SOMA) at Langley Research Center, leads the TMC panel.
- TMC evaluators are a mix of the best non-conflicted contractors, consultants, and Civil Servants who are experts in their respective fields.
- Basic Assumption: Proposers are the experts on their proposals.
  - Proposer's task is to demonstrate that implementation risk is Low.
  - TMC's task is to try to validate proposer's assertion of Low Risk.
  - The TMC Risk Assessment is based on a preliminary concept with appropriate benefit of the doubt given to the Proposer.
- Proprietary Information
  - All proposal and evaluation materials are considered proprietary.
  - Viewing of proposal materials will be only on a need-to-know basis.
  - Each evaluator will sign a Non-Disclosure Agreement (NDA) before they receive proposals.

Supplemental Material

Characteristics of Low Risk Ratings

- The project team and each of its key participants have demonstrated competence, appropriate qualifications, and a clear commitment to execute the project.
- The project is self-managed, but provides reasonable visibility to NASA for oversight.
- The project team has thoroughly analyzed all project requirements and consequently the proposed resources are clearly adequate to cover the projected needs.
- All risks have been/are being identified and managed by the team, with adequate plans to reduce or retire the risk before launch.
- There are no risks that require either a workaround or a development and qualification plan.
- Cost and schedule include adequate reserves to fix unforeseen problems that may arise.
- All contributed assets for the project are backed by letters of commitment.
- The team clearly understands the consequences of failing to meet technical, schedule, and/or cost commitments.

Characteristics of High Risk Ratings

- Technical Design Margins (Mass, Power, etc.)
  - Insufficient data provided to verify the margins.
  - No margins provided, or conflicting data provided.
  - Margins are deemed too low with respect to the level of maturity of the design.

- Cost
  - Concerns about cost reserves (*e.g.*, below AO requirement, too low based on identified liens/threats, phasing inconsistent with anticipated needs).
  - TMC unable to validate proposed cost

- Instrument Implementation
  - Unsubstantiated heritage claims
  - Development risks inadequately addressed.
  - Inadequate/inconsistent descriptions and details.
  - Inconsistencies between instrument requirements and bus capabilities.

Characteristics of High Risk Ratings

- Systems Engineering
  - Incomplete flow-down of science requirements to payload/flight system accommodations.
  - Inadequate description of how systems engineering functions will be executed.
  - Inadequate resources allocated to accomplish this function.

- Management Plans
  - Confusing/conflicting organizational roles and responsibilities.
  - Lack of demonstrated organizational/individual expertise for specified role.
  - Insufficient time commitments for key personnel.

- Schedules
  - Insufficient detail on which to base an independent assessment.
  - Inadequate/no schedule reserve identified.
  - Overly ambitious schedules that are not consistent with recent experiences.

TMC Independent Cost Assessment Pyramid

"The Pyramid"

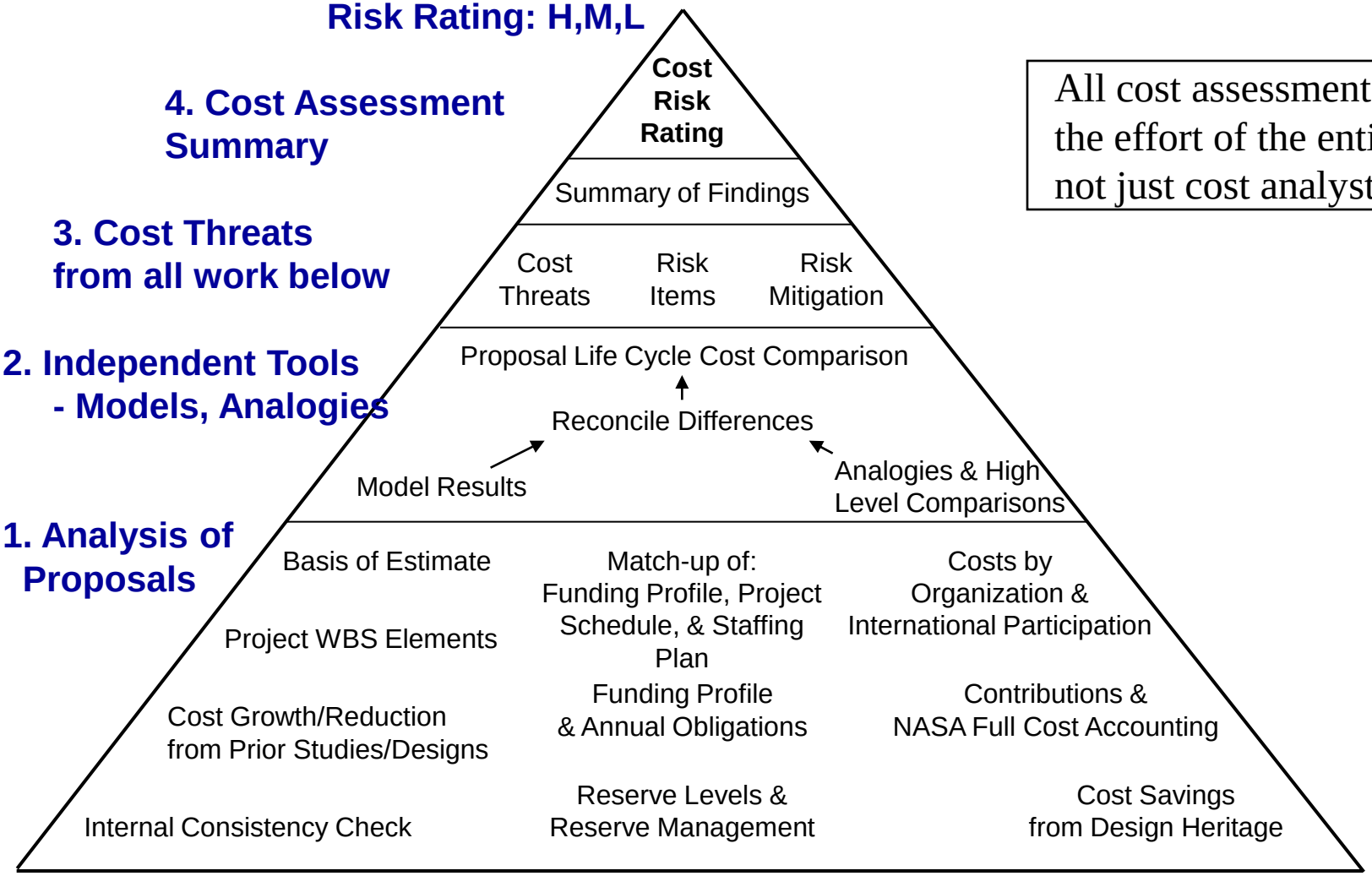
5. Overall Cost Risk Rating: H,M,L

4. Cost Assessment Summary

3. Cost Threats from all work below

2. Independent Tools - Models, Analogies

1. Analysis of Proposals



All cost assessments are the effort of the entire TMC, not just cost analysts.